

### ABSTRACT

Processes, methods and apparatus relating to olefin polymerization include the use of Raman spectrometry to monitor the concentration of reactants, products or other chemical components. One or more polymerization conditions are adjusted in response to those monitored concentrations. The present processes, methods and apparatus are applicable with slurry olefin polymerization process, even though such slurry processes contain solid particles were are known to interfere with Raman spectrometry. Furthermore, the present processes, methods and apparatus are applicable where there is some degree of overlap between Raman spectral peaks. Methods of monitoring and controlling olefin polymerization processes, reactants and other components use Raman spectrometry. Apparatus for olefin polymerization reactions have polymerization equipment, at least one Raman probe located in the polymerization equipment, and Raman spectrometry equipment located outside the polymerization equipment and operatively connected to at least one Raman probe.